UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/732,329	12/06/2000	Siddharth C. Sheth	42390P10218	1465

7590 03/22/2004

Edwin H. Taylor
Blakely, Sokoloff, Taylor & Zafman LLP
Seventh Floor
12400 Wilshire Boulevard
Los Angeles, CA 90025-1030

EXAMINER	
LAZARO, DAVID R	
ART UNIT	**PAPER NUMBER**
2155	2

DATE MAILED: 03/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/732,329	SHETH ET AL.	
	Examiner	Art Unit	
	David Lazaro	2155	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 December 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 December 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-19 are pending in this Office Action.

Claim Objections

2. Claims 7 and 12 objected to because of the following informalities: In line 3 of Claim 7 and Line 4 of Claim 12, "external central processing unit" should be "external processor" for consistency. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 17 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 17 recites the limitation "external central processing unit" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

7. Claims 1-5, 7-10, 12-15 and 17-19 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,275,861 Chaudri et al. (Chaudri).

8. With respect to Claim 1, Chaudri teaches a method, comprising: identifying a combination of fields in a header (Col. 2 lines 55-58 and Col. 8 lines 4-7) of an internet protocol version 4 (hereinafter IPv4) packet (Col. 2 lines 10-12), wherein the combination is dynamically modifiable (Col. 4 lines 58-64 and Col. 6 lines 45-49); and utilizing the combination of fields to classify the IPv4 packet (Col. 4 lines 45-47 and Col. 6 lines 22-63).

9. With respect to Claim 2, Chaudri teaches all the limitations of Claim 1 and further teaches a. constructing a key (Col. 5 lines 1-4) according to information in a key construction register (Col. 6 lines 41-49); b. identifying a tag that corresponds to the key from a table of key-tag entries in a memory device (Col. 6 lines 50-63); and c. inserting

the tag in the header of IPv4 packet in accordance to information in a tag insertion register (Col. 7 lines 1-5 and lines 14-18).

10. With respect to Claim 3, Chaudri teaches all the limitations of Claim 2 and further teaches the information in the key construction register indicates a retrieval location in the header of IPv4 packet (Col. 4 lines 65-67) and a number of bits from the retrieval location (Col. 4 lines 58-64) to consider in constructing the key (Col. 5 lines 1-3 and Col. 6 lines 41-49).

11. With respect to Claim 4, Chaudri teaches all the limitations of Claim 2 and further teaches the information in the tag insertion register indicates a number of bits to retrieve from the tag (Col. 7 lines 17-18 and Col. 6 line 43) and an insertion location in the header of IPv4 packet to insert the tag (Col. 6 line 44).

12. With respect to Claim 5, Chaudri teaches a broadband engine (Fig. 6) , comprising: a. a transceiver module (Fig. 7, interface between 101 and 104); and b. a lookup module (Fig. 6, 111), coupled to an external processor via an external processor interface (Fig. 6, 104), an external content adjustable memory (Fig. 6, 110) and the transceiver module, further including: a processing core (Fig. 7, 112) to classify an internet protocol version 4 (hereinafter IPv4) packet (Col. 2 lines 10-12) by utilizing a dynamically modifiable (Col. 4 lines 58-64 and Col. 6 lines 45-49) combination of fields in a header of the IPv4 packet (Col. 2 lines 55-58 and Col. 8 lines 4-7).

13. With respect to Claim 7, Chaudri teaches all the limitations of Claim 5 and further teaches the lookup module further comprising: a. a plurality of registers to contain key construction information and tag insertion information from the external central

processing unit (Col. 6 lines 39-49); and b. the processing core to construct a key according to the key construction information (Col. 5 lines 1-4), retrieve a tag that corresponds to the key from the external content adjustable memory (Col. 6 lines 50-62) and insert the tag in a header of one of the packets based on the tag insertion information (Col. 7 lines 1-5 and lines 14-18).

14. With respect to Claim 8, Chaudri teaches all the limitations of Claim 7 and further teaches the key construction information further comprises: a retrieval location in the header of IPv4 packet (Col. 4 lines 65-67) and a number of bits from the retrieval location (Col. 4 lines 58-64) to consider in constructing the key (Col. 5 lines 1-3 and Col. 6 lines 41-49).

15. With respect to Claim 9, Chaudri teaches all the limitations of Claim 7 and further teaches the tag insertion information further comprises: a number of bits to retrieve from the tag (Col. 7 lines 17-18 and Col. 6 line 43) and an insertion location in the header of IPv4 packet to insert the tag (Col. 6 line 44).

16. With respect to Claim 10, Chaudri teaches a line card (Fig. 7, 100), comprising: an input/output interface (Fig. 7, any Port); a switch fabric interface to communicate with a switch fabric (Fig. 7, 130); and a broadband engine (Fig 6), coupled to the input/output interface and the switch fabric interface, further including: a. a transceiver module to receive a plurality of packets from the input/output interface (Fig. 7, interface between 101 and 104); and b. a lookup module (Fig. 6, 111), coupled to an external content adjustable memory (Fig. 6 110), the transceiver module and an external processor (Fig. 6 104), further including: a processing core (Fig. 7, 112) to classify an internet protocol

version 4 (hereinafter IPv4) packet (Col. 2 lines 10-12) by utilizing a dynamically modifiable combination of fields in a header of the IPv4 packet packet (Col. 4 lines 45-47 and lines 58-67, and Col. 6 lines 22-63).

17. With respect to Claim 12, Chaudri teaches all the limitations of Claim 10 and further teaches the lookup module further comprising: a. a plurality of registers to contain key construction information and tag insertion information from the external central processing unit (Col. 6 lines 39-49); and b. the processing core to construct a key according to the key construction information (Col. 5 lines 1-4), retrieve a tag that corresponds to the key from the external content adjustable memory (Col. 6 lines 50-62) and insert the tag in a header of one of the packets based on the tag insertion information (Col. 7 lines 1-5 and lines 14-18).

18. With respect to Claim 13, Chaudri teaches all the limitations of Claim 12 and further teaches the key construction information further comprises: a retrieval location in the header of IPv4 packet (Col. 4 lines 65-67) and a number of bits from the retrieval location (Col. 4 lines 58-64) to consider in constructing the key (Col. 5 lines 1-3 and Col. 6 lines 41-49).

19. With respect to Claim 14, Chaudri teaches all the limitations of Claim 12 and further teaches the tag insertion information further comprises: a number of bits to retrieve from the tag (Col. 7 lines 17-18 and Col. 6 line 43) and an insertion location in the header of IPv4 packet to insert the tag (Col. 6 line 44).

20. With respect to Claim 15, Chaudri teaches a communication system (Col. 1 lines 19-20), comprising: a. a switch fabric (Fig. 7, 130); b. a main processing engine with an

processor (Fig. 7, 104); and c. a line card, coupled to the switch fabric via a switch fabric interface (Fig.7, 130), further including: an input/output interface (Fig. 7, Ports 1-4); a broadband engine (Fig. 6), coupled to the input/output interface and the switch fabric interface, further comprising: i. a transceiver module to receive a plurality of packets from the input/output interface (Fig. 7, interface between 101 and 104); and ii. a lookup module (Fig. 6, 111), coupled to an external content adjustable memory (Fig.6, 110), the transceiver module and the processor, further including: a processing core (Fig. 7, 112) to classify an internet protocol version 4 (hereinafter IPv4) packet (Col. 2 lines 10-12) by utilizing a dynamically modifiable (Col. 4 lines 58-64 and Col. 6 lines 45-49) combination of fields in a header of the IPv4 packet (Col. 2 lines 55-58 and Col. 8 lines 4-7).

21. With respect to Claim 17, Chaudri teaches all the limitations of Claim 15 and further teaches the lookup module further comprising: a. a plurality of registers to contain key construction information and tag insertion information from the external central processing unit (Col. 6 lines 39-49); and b. the processing core to construct a key according to the key construction information (Col. 5 lines 1-4), retrieve a tag that corresponds to the key from the external content adjustable memory (Col. 6 lines 50-62) and insert the tag in a header of one of the packets based on the tag insertion information (Col. 7 lines 1-5 and lines 14-18).

22. With respect to Claim 18, Chaudri teaches all the limitations of Claim 17 and further teaches the key construction information further comprises: a retrieval location in the header of IPv4 packet (Col. 4 lines 65-67) and a number of bits from the retrieval

location (Col. 4 lines 58-64) to consider in constructing the key (Col. 5 lines 1-3 and Col. 6 lines 41-49).

23. With respect to Claim 19, Chaudri teaches all the limitations of Claim 17 and further teaches the tag insertion information further comprises: a number of bits to retrieve from the tag (Col. 7 lines 17-18 and Col. 6 line 43) and an insertion location in the header of IPv4 packet to insert the tag (Col. 6 line 44).

Claim Rejections - 35 USC § 103

24. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

25. Claim 6, 11, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chaudri in view of U.S. Patent 6,611,875 by Chopra et al. (Chopra).

26. With respect to Claim 6, Chaudri teaches all the limitations of Claim 5 and further teaches the transceiver module further collections a portion of incoming packets (Col. 5 line 9-11). Chaudri does not explicitly disclose the transceiver appends control information. Chopra teaches a transceiver module that appends control information to a collected portion of an incoming packet (Col 8 lines 41-48 and lines 58-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to take the engine disclosed by Chaudri and modify it as indicated by Chopra such that

the transceiver module further appends control information to the collected portion. One would be motivated to have this as it insures internal processing is controlled more efficiently (Col. 7 lines 55-67).

27. With respect to Claim 11, Chaudri teaches all the limitations of Claim 10 and further teaches the transceiver module further collections a portion of incoming packets (Col. 5 line 9-11). Chaudri does not explicitly disclose the transceiver appends control information. Chopra teaches a transceiver module that appends control information to a collected portion of an incoming packet (Col 8 lines 41-48 and lines 58-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to take the line card disclosed by Chaudri and modify it as indicated by Chopra such that the transceiver module further appends control information to the collected portion. One would be motivated to have this as it insures internal processing is controlled more efficiently (Col. 7 lines 55-67).

28. With respect to Claim 16, Chaudri teaches all the limitations of Claim 15 and further teaches the transceiver module further collections a portion of incoming packets (Col. 5 line 9-11). Chaudri does not explicitly disclose the transceiver appends control information. Chopra teaches a transceiver module that appends control information to a collected portion of an incoming packet (Col 8 lines 41-48 and lines 58-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to take the system disclosed by Chaudri and modify it as indicated by Chopra such that the transceiver module further appends control information to the collected portion. One

would be motivated to have this as it insures internal processing is controlled more efficiently (Col. 7 lines 55-67).

Conclusion

29. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

30. U.S. Patent Application Publication 2001/0002476 by Abdat "Generating searchable data entries and applications therefore" May 31, 2001. Gives an embodiment for packet classification using a search key and CAM.

31. U.S. Patent 6,651,099 by Dietz et al. "Method and apparatus for monitoring traffic in a network" November 18, 2003. Classifies packets by generating a key from selected parts of a packet.

32. U.S. Patent 6,647,424 by Pearson et al. "Method and apparatus for discarding data packets" November 11, 2003. Uses multiple fields of a packet to classify it into an internal service class.

33. U.S. Patent 6,600,744 by Carr et al. "Method and apparatus for packet classification in a data communication system" July 29, 2003. Generates a key from various portions of various fields of a packet based on what is appropriate for the particular classification operation.

34. U.S. Patent 6,560,610 by Eatherton et al. "Data structure using a tree bitmap and method for rapid classification of data in a database" May 6, 2003. Uses Multi-field packet classification in combination with a CAM element.

35. U.S. Patent 6,041,053 by Douceur et al. "Technique for efficiently classifying packets using a trie-indexed hierarchy forest that accommodates wildcards" March 21, 2000. Uses fields of interest from a packet header to form a key in order to classify and associate the packet with a particular QOS queue.

36. Gupta et al. 'Packet classification on multiple fields' Proceedings of the conf. On Applications, technologies, architectures, and protocols for computer communications, Cambridge, MA. August 1999, pp.147-160.

37. Lakshman et al 'High-speed policy based packet forwarding using efficient multi-dimensional range matching' Proc. Of the ACM SIGCOMM 1998 Conf., Vancouver, pp. 203-214.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Lazaro whose telephone number is 703-305-4868. The examiner can normally be reached on 8:30-5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hosain Alam can be reached on 703-308-6662. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David Lazaro
March 15, 2004

HOSAIN ALAM
SUPERVISORY PATENT EXAMINER